



**Energy Efficiency and Renewable Energy
Federal Energy Management Program**

How to Buy a Water-Saving Faucet

Why Agencies Should Buy Efficient Products

- Executive Order 13123 and FAR section 23.704 direct agencies to purchase products in the upper 25% of energy efficiency, including all models that qualify for the EPA/DOE ENERGY STAR® product labeling program.
- Agencies that use these guidelines to buy efficient products can realize substantial operating cost savings and help prevent pollution.
- As the world's largest consumer, the federal government can help "pull" the entire U.S. market towards greater energy and water efficiency, while saving taxpayer dollars.

Federal Supply Source:

- General Services Administration (GSA)
Phone: (817) 978-8640

For More Information:

- DOE's Federal Energy Management Program (FEMP) Help Desk and World Wide Web site have up-to-date information on energy-efficient federal procurement, including the latest versions of these recommendations.
Phone: (800) 363-3732
www.eren.doe.gov/femp/procurement
- American Water Works Association's "WaterWiser" is a good resource for water conservation and efficiency information.
Phone: (800) 559-9855
www.waterwiser.org
- California Energy Commission (CEC) has a list of certified plumbing fixtures.
Phone: (916) 654-5106
ftp://energy.ca.gov/pub/efftech/appliance
- *Home Energy* magazine provides water conservation tips.
Phone: (510) 524-5405
www.homeenergy.org
- *Consumer Reports* rates plumbing fixtures.
www.consumerreports.org
- Contact your local water utility for details about local water conservation programs and incentives.
- Lawrence Berkeley National Laboratory provided supporting analysis for this recommendation.
Phone: (202) 646-7950

Efficiency Recommendation

Product Type	Recommended Flow Rate ^a	Best Available Flow Rate	Self-Closing
Faucet ^b	2.0 gallons per minute or less	1.5 gallons per minute	0.25 gallons per cycle

a) Based on ASME test procedure A112.18.1M-1996, with an inlet water pressure of 60 pounds per square inch (psi).

b) This Recommendation covers residential kitchen and bathroom sink faucets, as well as commercial bathroom sink faucets.

Definition

Self-Closing Faucet means a fitting that has an automatic shutoff after a preset time, or when the user moves away.

The federal supply source for water-saving faucets is the General Services Administration (GSA), which offers them through its "Special Order" program. Request models that meet this Efficiency Recommendation. When buying from a commercial source (retailer or distributor), select or specify models with a flow rate that meets the recommended level.

Self-closing and metered faucets shut off automatically after a specified time, or when the user moves away, resulting in significant water savings. A typical on-cycle is 10 seconds, in compliance with the Americans with Disabilities Act (ADA) regulations.

Adding a faucet aerator is a cost-effective way to save water. Faucet aerators replace the faucet head screen, lowering the flow by adding air to the spray. High-efficiency aerators can reduce the flow from 2-4 gpm to less than 1 gpm at a fraction of the cost of replacing faucets. Refer to *Home Energy* and *Consumer Reports* for more information on aerators (see "For More Information").

Early replacement of older, high flow faucets can lead to even greater water and energy savings than shown in the cost-effectiveness table below.

Where to Find Water-Saving Faucets

Buyer Tips

Early Replacement

Faucet Cost-Effectiveness Example

Performance	Base Model ^a	Recommended Level	Best Available	Self-closing
Water Use Only				
Gallons per minute/cycle	2.2 gpm	2.0 gpm	1.5 gpm	0.25 gpc ^b
Annual Water Use	17,160 gallons	15,600 gallons	11,700 gallons	3900 gallons
Annual Water Cost	\$69	\$62	\$47	\$16
Lifetime Water Cost	\$570	\$520	\$390	\$130
For Electric Water Heating				
Annual Energy Use	970 kWh	890 kWh	700 kWh	310 kWh
Annual Energy Cost	\$58	\$54	\$42	\$19
Lifetime Energy Cost	\$450	\$410	\$320	\$140
Lifetime Energy and Water Cost Savings	–	\$90	\$310	\$750
For Gas Water Heating				
Annual Energy Use	54 therms	50 therms	42 therms	24 therms
Annual Energy Cost	\$21	\$20	\$17	\$10
Lifetime Energy Cost	\$180	\$170	\$140	\$80
Lifetime Energy and Water Cost Savings	–	\$60	\$220	\$540

a) The flow rate of the Base Model just meets the current federal standards for faucets, based on ASME standard test conditions.

b) The duration of 1 cycle is based on the Americans with Disabilities Act (ADA) specification of 10 seconds.

Cost-Effectiveness Assumptions

Faucet use is assumed to last for 1 minute, 30 times per day, and 260 days per year. The faucet water temperature is assumed to average 80°F and the inlet water pressure 60 psi. For self-closing faucets, each faucet use is assumed to require 2 on-cycles. The assumed electricity and gas prices are 6¢/kWh and 40¢/therm, the federal average energy prices in the U.S. The assumed combined water and waste-water price is \$4/1,000 gallons.

Using the Cost-Effectiveness Table

In the example above, a new faucet which just meets the Recommended flow rate of 2.0 gpm generates \$90 in water and energy cost savings when water heating is electric, or \$60 in savings if water is heated with gas. Similarly, a Best Available faucet, with a flow rate of 1.5 gpm, saves \$310 (with electric water heating) or \$220 (with gas water heating). Since first-cost premiums are either small or non-existent for these faucets, their purchase is virtually certain to be cost-effective. Enormous cost savings, of \$750 (electric) and \$540 (gas), are evidenced with the 0.25 gpc self-closing faucet. However, these faucets generally cost substantially more, and usually require additional maintenance.

What if my Water or Energy Price is different?

Recalculate your Lifetime Energy or Water Costs by using your own water and energy prices, and make the corresponding adjustments in the Lifetime Energy and Water Cost Savings. For example, to adjust for a different electricity price, multiply the Lifetime Energy Cost by this ratio: $\left(\frac{\text{Your price in } \text{¢/kWh}}{6.0 \text{ ¢/kWh}} \right)$. Similar adjustments can be made for different gas and water prices.

Definition

Lifetime Energy or Water Cost is the sum of the discounted value of annual energy or water costs, based on average usage and an assumed faucet life of 10 years. Future energy price trends and a discount rate of 3.4% are based on federal guidelines (effective from April, 2000 to March, 2001). Future water and waste water treatment costs are conservatively assumed to increase only at the rate of inflation.

Metric Conversions

1 gallon = 3.8 liters
 1 therm = 100,000 Btu
 = 29.3 kWh
 = 105.5 MJ
 1 psi = 6.9 kPa
 °F = (1.8 * °C) + 32

